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O.V. Sheshukova

Diagnostic Criteria in Choosing a Method of Deciduous Teeth Periodontitis Treatment

Ukrainian Medical Stomatological Academy, Poltava, Ukraine

Abstract. The study involved 38 children at the age of 5 to 9 years with chronic periodontitis of deciduous teeth. Exctracted teeth on account of chronic periodontitis were evaluated according to the level of resorption using the developed classification of resorption of deciduous teeth roots.

According to the analysis of the research data chronic periodontitis of deciduous teeth led to faster resorption of their roots earlier by 2.5-4.5 years. Exctraction of deciduous tooth is advisable in determining of the "very early primary" and "very early progressive" pathological resorption. Considering the degree of pathological resorption may be an additional diagnostic criterion when choosing a method of treatment of deciduous tooth chronic periodontitis.

Keywords: deciduous tooth; chronic periodontitis; pathological resorption.

Problem statement and analysis of the recent research

Complications of dental caries are very common among children's dental diseases. High prevalence of periodontitis indicates ineffective general primary and secondary prophylaxis and insufficient methods of dental caries and pulpitis treatment [1].

Effective treatment of deciduous teeth periodontitis remains unsolved in the medical practice of a pediatric dentist. This is related both to the anatomical and physiological peculiarities of the periodontium structure in childhood and, consequently, the peculiarities of the clinical course and ineffective methods of diagnostics, treatment, and rehabilitation of children with deciduous teeth periodontitis. The issue of deciduous teeth chronic periodontitis treatment tends to be unsolved despite the expansion of medications used locally. The existing Protocols of public medical care provision with a specialization in the "Pediatric Preventive Dentistry", 2007, widely interpret indications for the choice of the conservative methods of periodontitis treatment. The diagnosis is based on the clinical symptoms and radiography, which provides only an overview of the resorption process. Indications for tooth extraction involve resorption of more than 1/3 of the root, regardless the age at which this resorption was discovered.

However, most radiographic manifestations do not accurately differentiate various forms of destructive processes and the connection of clinical, radiological and morphological changes should be taken into account during the diagnosis [2].

Unfortunately, the major responsibility of a pediatric dentist in the daily practice is limited to defining the indications for surgery or conservative treatment according to the children's age. Conclusion as for therapeutic treatment or extraction of the tooth made by a dentist is based on the age of a child and the time of eruption [3].

We defined that under the influence of chronic inflammation the processes of resorption in periodontium can originate regardless of the age factor and long before the onset [4].

Therefore, the **objective of the research** was to define additional diagnostic criteria to the choice of the method for deciduous tooth periodontitis treatment.

Materials and methods of the research

38 children at the age of 5 to 9 years with chronic periodontitis of deciduous teeth were examined. The diagnosis was made in compliance with the international classification of dental diseases based on ICD-10 (k 04.4, 04.5). The diagnosis was made on the basis of the clarification of the complaints, the history and the results of the objective

examination and radiography. Special attention was given to the case history, the multiplicity of previous visits to the dentist as for the treatment of chronic periodontitis.

X-ray imaging was made to diagnose the forms of periodontium destructive lesions as well as to select the method for follow-up treatment. X-ray pattern was estimated as for location of the area of bone tissue destruction with subsequent measuring of their size in horizontal and vertical direction; the state and integrity of the follicle compact plate of the permanent tooth were also defined. Extracted teeth were assessed by the stage of resorption, using the classification of resorption types of deciduous teeth roots according to T. F. Vynogradova (1968) as well as personally developed classification [3]. The "very early initial" stage of resorption was defined in resorption of at least one tooth root on the length to 1/3 at the age period of stabilization of the tooth root. Regarding the first deciduous molar this was the age of 4.0 to 6.5. For the second deciduous molar the "very early initial" stage of resorption at the age of 4.5 to7.5 was defined in resorption of the root to 1/3 of the length.

Resorption of the first deciduous molar for more than 1/3 at the age of 4.5 to 6.5, and the second deciduous molar in a child at the age of 4.5 to 7.5 was defined as the "very early progressive".

The resorption of the first deciduous molar roots in a child at the age of 6.5 to 8.5 at the level from 1/3 to 2/3 of the root was characterized as the "early progressive". Regarding the second deciduous molar such stage was defined in resorption of roots at the level of 1/3 of the length up to 2/3 in a child at the age of 7.5 to 9.5.

Results of the research and their discussion

According to the results of the research, resorption of deciduous teeth roots always develops more intensively and is radiographically accompanied by bone destruction in cases of pathological resorption caused by a chronic inflammatory process.

Chronic inflammation in the deciduous teeth periodontium greatly accelerates the resorption of their roots, already initiated according to the physiological age processes.

X-ray imaging and analysis of the child age as well as the state of extracted teeth promoted the detection of signs of physiological progressing resorption in 2.6% of examined teeth. "Very early initial" stage of pathological resorption was detected in 7.9% of patients; "very early progressing" stage was observed in 47.4% of extracted teeth; "early progressing" stage was detected in 38.8% of examined teeth. Therefore, the state of significantly severe resorption of roots in chronic periodontium inflammation fell within the age-related period normally characterized by the absence of resorption signs (the period of root stabilisation) constituting 55.3%.

According to the case history all these teeth were treated more than once in connection with chronic periodontitis and its aggravation. Clinical manifestations of the disease were normalizing for 63 ± 13 days on average, followed by aggravation.

Less amount of root resorption was detected in the majority of teeth examined after extraction compared to the radiography data. However, more than half of the cases showed the inflammation in the deciduous tooth periodontium accompanied by the formation of granulation focus.

The Stage 2 granulation focus formation was detected more frequently, i.e., onset of the bone defect due to resorption of compact and spongy substance around root apexes, which were also resorbed. Bone lamella between the focus and the follicle was reduced, but preserved.

Various nature of inflammation and state of the roots can often be observed in the deciduous molars. Therefore, consideration of the stage of pathological resorption of the most affected root is a major factor in determining the boundaries of the conservative treatment of deciduous tooth.

The clinical example is provided below for illustration. The patient M., was born in 2008 and at the age of 7 at the moment of the examination. On February, 16, 2015 parents with the child visited the dentist with complaints of the left mandible tooth pain, intensifying while biting. Parents stated that the tooth was treated more than once.

On examination: the face was asymmetric due to left mandible edema; submandibular ganglions were enlarged on the left and painful while palpated.

Status localis: filling on 75 masticatory surfaces, the tooth color was changed; vertical and horizontal percussion was painful. Alveolar ridge mucosa was hyperemic in the area of 75, swelled, painful palpation. CFE index + cf = 4, HI = 2.5 according to Fedorov-Volodkina; Pisarev-Shiller test – negative.

Provisional diagnosis: subcompensated form of dental caries activity, aggravation of chronic periodontitis of tooth 75.

Radiography of tooth 75 of 16.02.2005: bone tissue resorption in the area of furcation 75 without clear boundary, resorption of the distal root on 1/3 of the length (Fig. 1).

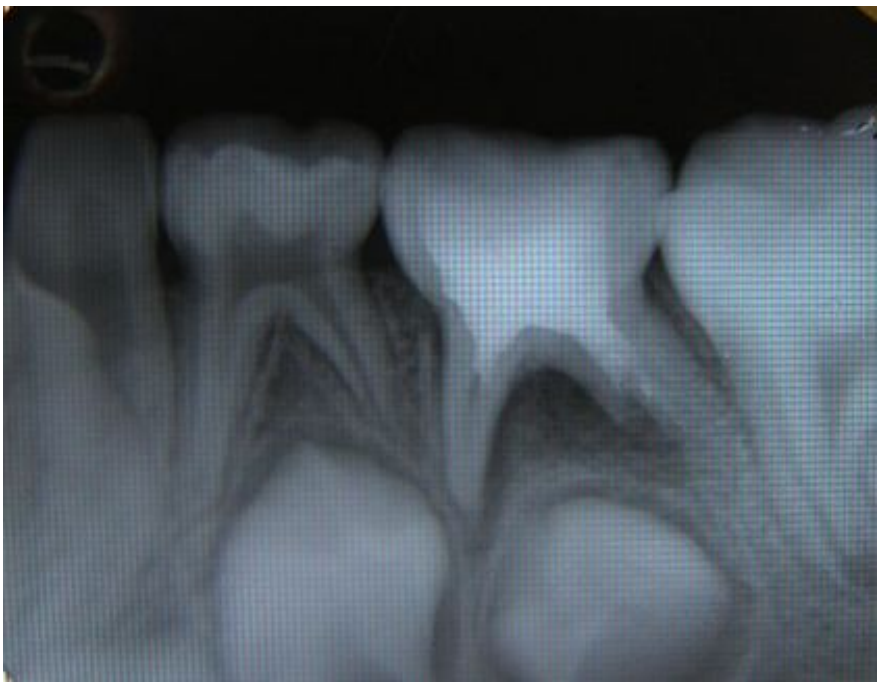

Fig. 1. Radiography of patient M.

Diagnosis: Subcompensated form of caries activity, aggravation of chronic 75 granulating periodontitis.

Treatment plan. Indication for 75 extraction considering the stage of tooth root resorption. Treatment: extraction of 75 under mandibular and buccal Sol.Lidocaina 2% anesthesia. Hemostasis (Fig.2).

Fig.2. Extracted 75 tooth of patient M.

The examination of extracted tooth revealed the resorption of the medial root to 1/3, porosity and eroding of the inner surface of the roots, perforation of the inner surface of the distal root due to pathological resorption. Granuloma, fixed to the apex of distal root was extracted together with the root.

Considering the age of the child, the group assignment of the tooth and parameters of physiological age of resorption it was established that chronic periodontium inflammation led to early progressing pathological resorption of the root.

Therefore, on the assumption of the timing of roots physiological resorption it is evident that chronic periodontium inflammation begins 2.5-4.5 years earlier. The analysis of the resulting data showed that examined teeth with "very early initial" and "very early progressive" stages of pathological resorption were extracted due to ineffective therapeutic treatment.

Conclusions

Considering the fact that pathological resorption of roots expands the indications for surgical treatment of deciduous teeth periodontitis as well as outcomes of the study of state of deciduous teeth roots resorption in chronic periodontium inflammation we believe that it is reasonable to extract the teeth in detection of very early progressive and early progressive pathological resorption of their roots.

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